

## Remarks

### *Summary of patentability issue*

The claims recite ranges for ink Ka values and solution Ka values, which ranges produce a smear-resistant, high density image. In contrast, the cited art fails to show these ranges or recognize the advantages thereof, thereby failing to recognize Ka as such a result-effective variable. And MPEP § 2144.05, II.,B. prohibits such rejections if the art fails to recognize that the claimed parameter is a result-effective variable. Therefore, are the outstanding rejections of the claims over this art still proper?

### *Status of the claims*

Claims 1-10 are pending. Claim 7 has been amended. Claim 10 has been added. Claims 1-3, 8, and 10 are independent.

### *Requested action*

Applicants respectfully request that the Examiner reconsider and withdraw the outstanding rejections in view of the foregoing amendments and the following remarks.

### *Formal rejection*

Claims 1-9 were rejected under 35 U.S.C. § 112, second paragraph because 1) the term “processing liquid” can encompass both chromatic and achromatic liquids, and 2) the method recited in Claim 7 is unclear concerning the recitation of the color ink.

In response, while not conceding the propriety of the rejection, Claim 7 has been amended to address the points raised by the Examiner. Applicants submit that as amended, Claim 7 now even more clearly satisfies 35 U.S.C. § 112, second paragraph.

In addition, Applicants respectfully traverse the objection to the term “processing liquid”, since one of ordinary skill in the art would know what is meant by this term, just as the skilled artisan would know what is meant by a claim using the term “printer”, even though the claim may not specify whether the printer is an ink jet printer or a laser printer. More generally, Applicants submit that as long as a generic term encompassing a variety of possible embodiments can be understood by the skilled artisan, it is proper under 35 U.S.C. § 112, second paragraph. Moreover, Applicants are aware of no requirement of 35 U.S.C. § 112, second paragraph, forbidding the recitation of a generic term in claims.

For all of these reasons, Applicants request that the rejection be withdrawn.

#### *Substantive rejections*

Claim 1 was rejected under 35 U.S.C. § 103(a) as allegedly obvious over either Shioya, et al. (U.S. Patent No. 5,864,350) or Yokoi (U.S. Patent No. 5,959,641). Claims 1-7 and 9/1 were rejected under 35 U.S.C. § 103(a) as allegedly obvious over Shioya, et al. or Yokoi, in further view of Inui, et al. (U.S. Patent No. 6,062,674).

#### *Response to substantive rejections*

These rejections are respectfully traversed for the following reasons.

Independent Claim 1 relates to a recording method comprising a step of ejecting onto a recording material ink having a Ka value of not more than 3 (ml.m<sup>-2</sup>.msec<sup>-1/2</sup>), and a step of

applying to the ink deposited on the recording material, a processing liquid having a  $K_a$  value of not less than 5 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ ) to insolubilize a coloring material in the ink inside the recording material. Claim 1 also recites that the processing liquid is applied to the ink after the ink is deposited on the recording material and after a rapid swell start point ts passes after penetration of the ink into the medium.

By this arrangement, the processing liquid catches up with the ink penetrating the recording medium to insolubilize the ink, thereby suppressing further penetration of the ink into the recording medium, producing a high-density image. Moreover, because the ink has already penetrated the surface of the recording medium, it is more difficult to rub off of the recording medium, thereby increasing the durability of the image. These dual advantages are achieved by selecting the  $K_a$  values in the ranges recited in Claim 1, and in the ranges recited in independent Claims 2, 3, 8, and 10 .

MPEP §2143 places the burden on the Examiner to establish a *prima facie* case of obviousness by a preponderance of the evidence.

With regard to rejections under 35 U.S.C. § 103, the examiner must provide evidence which as a whole shows that the legal determination sought to be proved (i.e., the reference teachings establish a *prima facie* case of obviousness) is more probable than not. (MPEP, Original Seventh Edition, Revision 1, February 2000, page 2100-97, right column, lines 13-17)

In addition, the MPEP has more specific requirements when the Office rejects claims reciting ranges. MPEP § 2144.05, II., B. states that:

A particular parameter must first be recognized as a result-effective variable, i.e., a variable which achieves a recognized result, before the determination of the optimum or workable ranges of said variable might be characterized as routine experimentation. (MPEP, Original Seventh Edition, Revision 1, February 2000, page 2100-107, left column, lines 33-38)

Yet here, the Office Action has not cited either the Shioya patent, the Yokoi patent, or the Inui patent to show the ranges recited in the independent claims. Moreover, the Office Action has not cited these patents to show that proper selection of the ink Ka and the processing-liquid Ka can produce a smear-resistant, high density image. Rather, the Office Action merely concludes that the claimed ranges are obvious because diffusion of ink is a common concern in the art. But this conclusion is improper under MPEP § 2144.05, in the absence of a reference recognizing that the proper selection of the ink Ka and the processing-liquid Ka can produce a smear-resistant, high density image.

For this reason, Applicants respectfully request that the Office withdraw the rejections of the claims under 35 U.S.C. § 103.

The dependent claims are allowable for the reasons given with respect to the independent claims and because they recite features which are patentable in their right. Individual consideration of the dependent claims is respectfully solicited.

The other art of record is also not understood to disclose or suggest the inventive concept of the present invention as defined by the claims.

In view of the above amendments and remarks, the claims are now in allowable form. Therefore, early passage to issue is respectfully solicited.

Applicants' undersigned attorney may be reached in our Washington, D.C. office by telephone at (202) 530-1010. All correspondence should continue to be directed to our below-listed address.

Respectfully submitted,

A handwritten signature in black ink, appearing to read "Gary Jacob". The signature is fluid and cursive, with a large loop at the end.

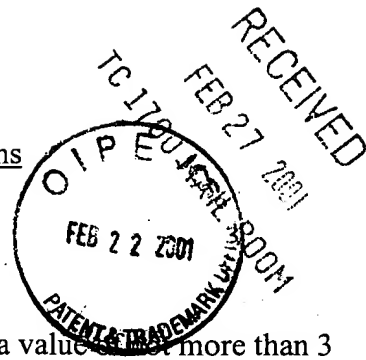
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Marked-up Copy of Amended Claims



1. (Amended) A recording method comprising:  
a step of ejecting onto a recording material ink having a  $K_a$  value not more than 3 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ ); and  
a step of applying to the ink deposited on the recording material, a processing liquid having a  $K_a$  value of not less than 5 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ ) to [insolubilized] insolubilize a coloring material in the ink inside the recording material[;],  
wherein the processing liquid is applied to the ink after the ink is deposited on the recording medium and after a rapid swell start point ts passes after penetration of the ink into the medium [passes after the ink is deposited on the recording material].

2. (Amended) A recording method comprising the steps of:  
ejecting onto a recording material ink having a  $K_a$  value not less than 1 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ );  
then  
applying heat to the ink; and  
applying to the ink a processing liquid having a  $K_a$  value not less than 1 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ ).

3. (Amended) A recording method comprising the steps of:  
ejecting to a recording material ink having a  $K_a$  value not more than 1 ( $\text{ml.m}^{-2}.\text{msec}^{-1/2}$ )  
and having a penetration property [which] that increases with heat; then  
applying heat to the ink; and

applying to the ink a processing liquid having a  $K_a$  value not less than  $1 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$ .

4. (Amended) An apparatus according to Claim 1 or 3, further comprising the step of applying heat to a reaction product of the ink and the processing liquid after said processing liquid applying step.

5. (Amended) A recording method according to Claim 4, wherein the  $K_a$  value is not more than  $5 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$ .

7. (Amended) A method according to Claim 1 or 6, wherein the ink includes [is] a black ink and a color ink, wherein ink having a  $K_a$  value of not more than  $3 \text{ (ml.m}^{-2}\text{.msec}^{-1/2}\text{)}$  is the black ink, and after application of the processing liquid, color ink is deposited.

8. (Amended) A recording method comprising the steps of:  
depositing ink containing a coloring material having a polarity onto a recording material;  
and then

applying to the ink, a processing liquid having a polarity opposite from that of said coloring material after a rapid swell start point ts after penetration of the ink onto the recording material, so that the coloring material in the ink is insolubilized by the processing liquid at least inside the recording material.

9. (Amended) A method according to Claim 1 or 8, wherein the ink and the processing liquid [is] are ejected to the recording material by generating a bubble by application of thermal energy to the ink and to the processing liquid.